CENTRAL INTELLIGENCE AGENCY
Directorate of Intelligence
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INTELLIGENCE MEMORANDUM

The Status of North Vietnam's Petroleum Storage Facilities as of 25 May 1967

Summary

The air campaign against North Vietnam's petroleum storage facilities has destroyed about 85 percent of the 128,000 tons of major storage capacity existing when the Rolling Thunder program started. In addition over 5,000 tons of storage capacity at dispersed sites have been destroyed.

The strikes have increased the cost and difficulty of importing and distributing petroleum but have not effectively reduced North Vietnam's capability to maintain petroleum supplies. North Vietnam has developed a dispersed storage system of tank sites and drums with a capacity of between 65,000 and 80,000 tons. The volume of petroleum supplies is being maintained at levels adequate to meet requirements for a period of 100 to 120 days.

In the face of this success North Vietnam has made no effort to restore any of the major bomb damaged facilities. Moreover, it is unlikely to do so as long as the bombings continue. If reconstruction were attempted, the time required would vary from as little as 7 days to a maximum of 180 days. The reconstruction programs would, however be dependent on foreign

Effects of Air Strikes on Petroleum Storage Facilities

1. At the start of the Rolling Thunder program in February 1965, the North Vietnamese had 13 fixed petroleum storage facilities with a combined capacity of about 128,000 metric tons that were on the JCS-target list. Through 25 May 1967 a total of 75 strikes against these facilities had destroyed about 85 percent -- 109,000 tons -- of their storage capacity. In addition over 5,000 tons of storage capacity -- including contents -- at dispersed sites have been destroyed.

2. Six of the JCS-targeted storage facilities suffered a loss of 100 percent of their storage capacity. These were the facilities at Hanoi, Nam Dinh, Do Son, Phu Qui, Phu Van, and Duong Nam. The remaining seven facilities have a combined residual storage capacity of about 18,000 tons.

3. The air strikes against JCS-targeted petroleum storage facilities undoubtedly have been effective when measured in terms of the storage capacity and petroleum destroyed. The strikes were also effective in increasing the cost and difficulty of importing and distributing petroleum. The strikes have, however, not been effective in reducing North Vietnam's capability to maintain petroleum supplies. This capability stems principally from the development of dispersed bulk oil storage capacity before extensive attacks against JCS-targeted facilities began.

4. North Vietnam now has more than 100 dispersed petroleum storage tank sites with a total estimated capacity of between 30,000

and 40,000 tons. Increased flexibility and capacity has been given to the petroleum storage and distribution system by the accumulation of 55 gallon drums. The storage capacity of North Vietnam's inventory of drums is estimated at between 35,000 and 40,000 tons. In addition, there is an indeterminate amount of "floating storage capacity" represented by oil barges, rail tank cars, tank trucks, and a newly assigned small tanker for use in North Vietnamese waters.

5. North Vietnam currently has less bulk storage capacity than it had over a year ago but its programs for dispersed storage appears to have improved its position above what it was during the summer of 1966 when the bombing reached its peak effectiveness. There is no evidence that the bombing of petroleum targets has seriously weakened the economy, produced significant shortages of petroleum, or diminished North Vietnam's capability to support military activities or the infiltration of men and supplies into Laos and South Vietnam. The estimated level of petroleum supplies in North Vietnam at the end of April 1967, for example, was at essentially the same levels as it was at the beginning of 1966, as shown in the following tabulation:

Date	Stocks (1,000 tons)*
1 January 1966	46 to 71
28 Jun 1966	78 to 103
31 December 1966	52 to 56
30 April 1967	54 to 69

* This range reflects the uncertain origin of 14,600 metric tons of petroleum shipped from Communist China during the first quarter of 1967. It cannot be determined whether this petroleum represents part of the 34,000 metric tons diverted to China in mid-1966 (previously considered to have been transshipped by rail to North Vietnam in 1966) or represents, in fact, petroleum of Chinese origin. The upper end of the range considers the shipments from China this year to represent petroleum of Chinese origin. The lower end of the range assumes that the shipments represent part of the petroleum diverted to China in 1966.

This volume of petroleum stocks is estimated to be adequate to satisfy current consumption for a period of 100 to 120 days.

Restoration of Damaged Facilities

6. The North Vietnamese have made no effort to restore any of the bombed petroleum storage sites that are on the JCS-target list. This is the result of the apparent effectiveness of the countermeasures adopted to offset the effects of the bombing. Moreover, the relative invulnerability of the dispersed tank sites and drums make it improbable that bombing, at its current levels and types of attack, will adversely affect the North Vietnamese capability to import and distribute petroleum.

7. If the North Vietnamese were to attempt to restore the petroleum facilities -- an unlikely probability -- the times required for reconstruction, assuming materials and labor are on site, would vary from as little as 7 days to a maximum of 180 days, as shown in the table. The maximum time would be required for the two major facilities at Haiphong and Hanoi. In all cases the speed and effectiveness of reconstruction efforts would be dependent on foreign technical assistance and materials.

North Vietnam: Physical Damage to Petroleum Storage Facilities and Estimated Restoration Times

Terminal	Capacity Destroyed Oil Tons a/ (thousands)	Restoration Number of Tanks b/	Restoration Time Required for Reconstruction (days)
Phu Van	0.9	3	10 - 30
Haiphong	40.1	34	90 - 180
Hanoi	30.6	32	90 - 180
Vinh	6.6	5	20 - 60
Nam Dinh	11.0	7	20 - 60
Nguyen Khe	2.5	10	60 - 120
Ha Gia	2.2	4	10 - 30
Bac Giang	0.7	1	7 - 21
Do Son	2.9	2	7 - 21
Viet Tri	1.4	4	20 - 60
Phu Qui	7.6	9	60 - 120
Duong Nham	4.1	5	30 - 90
Can Thon	0.8	40	90 - 120
Total	111.0	156	

a. This corresponds to the amounts of oil that could be stored in the capacity destroyed.
b. This corresponds to the number of tanks of standard Soviet design and capacity required to replace a similar (but not identical) number of tanks destroyed to provide the volume of storage lost.